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Assessment of compliance with anti tuberculosis drug treatment among patients with tuberculosis in Sokoto south local Government area of Sokoto state Nigeria

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ABSTRACT

The study employed quantitative descriptive study design to examine patients' compliance to Anti TB treatment among TB patients in Sokoto south local government Area of Sokoto Nigeria. The results were determined. 44.00% of the respondents were single, and 50% married, while 3.30% was divorced and widow with the least percentage of 2.70%. 58% of the respondent's ages 10-70 years were males and 42% age -10-70 years were females. The knowledge and understanding of TB was categorized into two: 78% of the respondents show highest percentage of 78% with no knowledge and understanding of TB while only 22% among them with the knowledge and understanding of TB. It was found that, 76.66% of the respondents aged 10-70 years complete the treatment and 23.33% of the respondents aged 10-70 years did not comply with the treatment. 36% of the respondents were aware of the implication of untreated TB, while 64% of the respondents were unaware of the implication of untreated TB. 46.70% of the respondents aged 10-70 years have none income, 24.70% aged 10-70 years have 5000-8000, while 14.00% of the respondents aged 10-70 years had 8000 and above. Employment assessment shows that 39.30% of the respondents were unemployed, 16.00% employed, 16.00% business people, 34. 00% of the respondents were students and 4.70% were farmers. 2.00% of the respondents had no education, 48.70% of the respondents had education and 10.0% of the respondents had tertiary education. All the respondents 100% are aware of free Anti-TB treatment printed by government of Sokoto State. 80% of the respondents collect their medications at designated centers in the clinics. Only 20% of the respondents collect from the Hospitals. It was revealed that, 92% of the respondents ware far away from the DOT designated centres, only 8% of the respondents are close to the centers in Sokoto state. Shows that 89.33% of the respondents' mode of transport was public transport, 8% travelled by foot and only 2.66% visit health facilities through their own transport system, possibly vehicles,

motorcycle or bicycler. 60% of the respondents take their medication in the morning, 24% in the afternoon, while 13% take their medication in the evening time and only 2.66% at bed time. 96.66% of the respondents take their medication after eat food 3.33% with food. 76.66 of the respondents were reminded on taking medications by their family members, 22% by visibility of the medication and only 1.33% is reminded by DOT supporter and no response for other category. Shows that 76.66% of the respondents did not missed taking medications within the last 7 days; only 23.33% missed their medications with last 7 days. Conclusively, majority of the respondents complied to Tb therapy.

Keywords: Tuberculosis, respondents, compliance, noncompliance, motorcycle, medication

INTRODUCTION

Tuberculosis is caused by *Mycobacterium tuberculosis*. When they enter the lungs, they walled off into harmless capsules, causing infection, which might develop into active TB disease. Tb is contagious disease which is transmitted from person to person via coughing, and breathing airborne droplets containing the bacteria. TB primarily affects lungs, then any other part of the body. TB infection is more likely in the following people: a. recently exposed people b. people living in congested setting, c. people living in poor countries d. People living with weak immunity e. People contacting TB contacts (American Thoracic Society, 2017; WHO, 2003; Abiola, 2009; WHO, 2017; Zegeye et al., 2019). Worldwide, about 9 million new cases and 2million deaths due to tuberculosis are being recorded. Due to poverty and poor settings, parts of Asia, Middle East, and Africa have the highest risk of the infection (Okeke et al., 2014; WHO, 2003; Zegeye et al., 2019). TB is ranked as the 9th cause of death worldwide, ranking above HIV/AIDS. Then it is a major public health issue scourging the world (Eharbor et al., 2020). Nigeria being the most populous in Africa, and with significant poverty level, coupled with preponderance poor settings, the spread of TB is easily feasible (Okeke et al., 2014; Kware et al., 2019). Patient compliance to drug therapy depends on many factors. Noncompliance is the main cause of failure of TB therapy and difficulty to attain Tb control goals (Saleem et al., 2015). In spite of the resources and time spent to control TB there is still much to be achieved (Woimo et al., 2017; Stop TB partnership, n.d.). Thus, there is need to assess the compliance and noncompliance to come up with more positive intervention strategies (Mohammed et al., 2016; WHO, 2017).

The aim of the study is to investigate factors that influence compliance to TB treatment among patients on anti-TB drug treatment in Sokoto south local government area, Sokoto.The objectives of this study are to: Identify factors that influence compliance to treatment among patients on anti-TB drug treatment, determine the factors that influence non-compliance to TB treatment among patients on anti-TB drug treatment, Examine relationship between patient characteristics and the compliance with treatment

MATERIALS AND METHODS

Study setting

The research was conducted in Sokoto South local area, which is located in Sokoto state metropolis, Nigeria. One specialist hospital, and seven clinics but only two DOT centers were available; specialist hospital and Mabera clinic DOT.

Study Design

The study employed quantitative descriptive study design to examine patients' compliance to Anti TB treatment among TB patients in Sokoto south local government Area of Sokoto Nigeria. The study design direct the researcher in planning and implementing the studying away that is most likely to achieve the intended goal. It is a blue print for conducting the study (Burns and Grove, 2001).

Study Population

Sampling

The population for this study consisted of 3000 males and females patients with TB, collecting treatment from specialist hospital Sokoto and other clinics in Sokoto south local government area. The sample size was 150 of a given population. The case register was used to select respondents. The respondents were selected according to particular interval; each second name on the list was selected.

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Data Collection

A questionnaire and structured interview were selected for data collection. Questionnaires were distributed among clients who were able to read and write for them to answer while those who cannot read and write were been asked and completed for them.

Instrument for data collection

The questionnaire used in the study was categorised into five segment; demographic data of the client, marital status, monthly income of the respondents, educational level and knowledge/ understanding of tuberculosis and factors associated with compliance to treatment.

Data Analysis

Descriptive and inferential statistics such as frequencies, percentages, tables, graphs and Analysis of Variance (ANOVA) were utilized to analyze the data. All statistical analysis was performed using computer software called Statistical Package for the Social Sciences (SPSS).

Ethical Considerations

Ethical measures are important in qualitative, quantitative research including conduct towards informants' information as well as honest reporting of the results. The ethical measures in this study include consent, confidentiality, privacy, dissemination of results and the right to withdraw from the study of the respondents. Permission from relevant authorities was sought.

RESULTS

The table 1 shows that 58% of the respondent's ages 10-70 years were males and 42% age -10-70 years were females. This indicated that majority of the respondents of 58% were males. This is in agreement with Erhabor *et al*., (2020).

Table 1: Showing Demographic information of the respondent base on sex and age groups

Sex	Age groups									Total	%
	10-25	%	26-35	%	36-45	%	46-55	%	56-70		
Male	24	27.60	16	18.40	15	17.20	16	18.40	16 15.90%	87	58%
Female	17	26.90%	14	22.20	11	17.50	11	17.50%	10 15.90%	63	42%
Total										**150**	**100%**

Percentage calculation for each sex and age

Table 2: Showing the marital status and age of the respondents

Marital status	Age groups										Total	percentage
	10-25	%	26-35	%	36-45	%	46-55	%	56-70	%		
Single	32	48.50%	12	18.20%	5	7.60%	15	22.70%	2	3.00%	66	44.00%
Married	3	4.00%	18	24.00%	18	24.00%	18	24.00%	18	24.00%	75	50%
Divorced	0	0.00%	1	20.00%	1	20.00%	2	40.00%	1	20.00%	5	3.30%
Widowed	0	0.00%	1	25.00%	1	25.00%	1	25.00%	1	25.00%	4	2.70%
Total	**35**	**23.30%**	**32**	**21.30%**	**25**	**16.70%**	**36**	**24.00%**	**22**	**14.70%**	**150**	**100%**

The table 2 shows that, the marital status of the respondents, where 44.00% were single, and 50% married with the highest percentage while 3.30% was divorced and widow with the least percentage of 2.70%.

Table 3: Shows the knowledge and understanding of TB among the respondent

S/no	Knowledge and Understanding of TB	No. Of Respondent	Percentage
1.	Yes	33	22%
2.	No	117	78%

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Total	**150**	**100%**

The table 3 shows that the knowledge and understanding of TB was categorized into two: 78% of the respondents show highest percentage of 78% with no knowledge and understanding of TB while only 22% among them with the knowledge and understanding of TB. This finding is in agreement with that of Woimo *et al.,* (2017) and is among the factors spurring noncompliance to tb therapy.

Table 4: Showed compliance and Non-Compliance of the Respondent, base on age group

Compliance and Non-compliance	Age groups										Total	%
		10-25	26-35	%	36-45	%	46-55	%	56-70	%		
Compliance	26.00%	30	23	20.00%	20	17.40%	21	18.00%	21	18.00%	115	76.66%
Non-Compliance	11.43%	4	9	25.70%	9	25.71%	9	25.71%	4	11.43%	35	23.33%
Total		**34**	**32**		**29**		**30**		**25**		**150**	**99.99%**

The table 4 shows that 76.66% of the respondents aged 10-70 years complete the treatment and 23.33% of the respondents aged 10-70 years did not comply with the treatment. This indicate that majority of the respondents of 76.66% complied with the treatment. This result contradicts the submissions of WHO (2003), Woimo *et al*., (2017), which said that knowledge of TB spurred compliance, since in this study respondents had poor knowledge, but compliance was very high. This might be due other factors (WHO, 2003).

Table 5: Showing the awareness of the implication of untreated TB among the respondents.

S/no	**Implication of Untreated TB**	**No. of Respondent**	**Percentage**
1.	Yes	54	36%
2.	No	96	64%

The table 5 shows that 36% of the respondents were aware of the implication of untreated TB, while 64% of the respondents were unaware of the implication of untreated TB. This indicated that majority of the respondent of 64% were aware of the implication of untreated TB. Poor awareness of dangers of noncompliance might lead to poor compliance (WHO, 2003).

Table 6: Showing income and age group of the respondents

Income (~~₦~~)	Age group										Total	%
	10-25	%	26-35	%	36-45	%	46-55	%	56-70	%		
~~₦~~100. None	23	33.00%	15	21.40%	12	17.10%	10	14.20%	10	14.20%	70	46.70%
~~₦~~ 1000-~~₦~~ 5000	7	18.90%	11	29.70%	5	13.50%	9	24.30%	5	13.50%	37	24.70%
~~₦~~5000-~~₦~~8000	3	13.60%	4	18.70%	6	27.30%	4	18.20%	5	22.70%	22	14.60%
~~₦~~8000 & above	2	9.60%	4	19.00%	1	4.80%	7	33.30%	7	33.30%	21	14.00%
Total	**35**	**23.30%**	**34**	**22.70%**	**24**	**16.00%**	**30**	**20.00%**	**27**	**18.00%**	**150**	**100%**

The table 6 shows that 46.70% of the respondents aged 10-70 years have none income, 24.70% aged 10-70 years have 5000-8000, while 14.00% of the respondents aged 10-70 years had 8000 and above. This indicated that majority of the respondents that scored 46.70% aged 10-70 years had none Income. This indicates that most of the respondents had an income of 5000 and below, which might deter them from compliance, because coming to the health facilities to collect or take medicine is costly, and poverty is a risk factor of noncompliance (Stop TB Partnership, n.d., WHO,2003).

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Table 7: Showing occupation and age group of the respondents

Occupation	Age group					Total	percentage
	10-25	26-35	36-45	46-55	56-70		
Unemployed	24	14	8	86	5	59	39.30%
Employed	1	6	6	3	8	24	16.00%
Business	1	6	3	8	6	24	16.00%
Student	19	3	1	0	1	36	24.00%
Farmer	0	2	2	3	0	7	4.70%
Total	**45**	**31**	**20**	**22**	**20**	**150**	**100%**

The table 7 shows that 39.30% of the respondents were unemployed, 16.00% employed, 16.00% business people, 34.00% of the respondents were students and 4.70% were farmers. This indicated that majority of the respondents were unemployed. Occupation too is a determinant factor of compliance; less privilege workers are more prone to noncompliance (WHO, 2003).

Table 8: Showing the educational level and age group of the respondents

Occupation	Age group					Total	percentage
	10-25	26-35	36-45	46-55	56-70		
None	3	0	0	0	0	3	2.00%
Qur'an	13	17	13	14	16	73	48.70%
Primary	3	1	3	10	3	20	13.30%
Secondary	21	7	7	2	2	39	26.00%
Tertiary	0	3	4	8	0	0	15
Total	**40**	**28**	**27**	**34**	**21**	**150**	**100%**

The table 8 shows that 2.00% of the respondents had no education, 48.70% of the respondents had education and 10.0% of the respondents had tertiary education. This indicated that majority of the respondent had Qur'anic education having scored 48.70%. Poor education level is a factor which spin compliance backward (WHO, 2003).

Table 9: Showing respondents awareness of availability of free anti-TB treatment

S/no	Availability of Free Anti-TB Treatment	Number of Respondents	Percentage %
1.	Yes z	150	100%
2.	No	0	0%
Total		**150**	**100%**

The table 9 shows that all the respondents 100% are aware of free Anti-TB treatment printed by government of Sokoto State. This is a factor that positively affects compliance (Stop TB partnership, n.d. Saleem *et al*., 2015).

Table 10: Showing different centers for the collection of medication

S/no	Centre for Collection of Medication	Number of Respondents	Percentage %
1.	Clinic	120	80%
2.	Hospital	30	20%
Total		**150**	**100%**

The table 10 shows that 80% of the respondents collect their medications at designated centers in the clinics. Only 20% of the respondents collect from the Hospitals. This is a good strategy to boost compliance since most of the respondents live in areas with no accessibility to hospitals.

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Table 11: Shows the distance between the respondents and health facilities

S/no	Distance to Health Facility	Number of Respondents	Percentage %
1.	Far	138	92%
2.	Close	12	8%
Total		**150**	**100%**

The table 11 shows 92% of the respondents ware far away from the DOT designated centres, only 8% of the respondents are close to the centers in Sokoto state. This is a factor that might affect compliance negatively (Stop TB Partnership, n.d., WHO, 2003; Woimo *et al*., 2017).

Table 12: Shows the means of transportation by the respondents

S/no	Mode of Transportation Collecting of Medication	Number of Respondents	Percentage %
1.	Walking	12	8%
2.	Own Transportation	4	2.66%
3.	Public transport	134	89.33%
Total		**150**	**100%**

The table 12 shows that 89.33% of the respondents mode of transport was public transport, 8% travelled by foot and only 2.66% visit health facilities through their own transport system, possibly vehicles, motorcycle or bicycler. This indicated that majority of the respondent visit centers (DOT) through public transport. This factor might positively affect compliance (Stop TB Partnership, n.d., WHO, 2003; Woimo *et al*., 2017).

Table 13: Shows the time at the respondents take their medication

S/no	Time of Taking medication	Number of respondents	Percentage %
1.	Morning	90	60%
2.	Afternoon	36	24%
3.	Evening	20	13.33%
4.	At bed time	4	2.66%
Total		**150**	**100%**

The table 13 shows that, 60% of the respondents take their medication in the morning, 24% in the afternoon, while 13% take their medication in the evening time and only 2.66% at bed time. Appropriate time essential in maintaining compliance (Woimo *et al*., 2017).

Table 14: Shows how medication is taken by the respondents

S/no	How Medication is Taken	Number of Respondents	Percentage %
1.	Before food	0	0%
2.	With food	5	3.33%
3.	After food	145	96.66%
4.	Others	0	0%
Total		**150**	**100%**

The table 14 shows that 96.66% of the respondents take their medication after eat food 3.33% with food and no response for both before food and others category.

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Table 15: Shows how respondents are reminded about taking medication

S/no	Reminder on How to Take Medication	Number of Respondents	Percentage %
1.	Family member reminds me	115	76.66%
2.	Keep medicine visible	33	22%
3.	DOT support remind me	2	1.33%
4.	Others	0	0%
Total		**150**	**100%**

The table 15 shows that 76.66 of the respondents were reminded on taking medications by their family members, 22% by visibility of the medication and only 1.33% are reminded by DOT supporter and no response for other category.

Table 16: Show those who miss taking of medication within the last 7 days

S/no	Missed taking TB medication Within The Last 7days	Number of Respondents	Percentage %
1.	Yes	35	23.33%
2.	No	115	76.66%
Total		**150**	**100%**

The table 17 shows that 76.66% of the respondents did not missed taking medications within the last 7 days; only 23.33% missed their medications with last 7 days.

TB is one of the most serious health issues worldwide, almost one third of the population has been infected with Mycobacterium tuberculosis (Woimo *et al*., 2017) Compliance can be refers to the extent to which the patient obeys the medical advice. Tuberculosis treatment takes time and requires successive administration of medicines. Non-compliance to the administration of these drugs is the main cause of initial therapy failure, development of multi drug resistance and relapses. Poor patients' compliance with TB treatment is one of the principal difficulties to get the goals of National TB Control Program. Summarily, in this study there is low understanding and knowledge of TB, high compliance (76.66%), and low noncompliance. There was low awareness and understanding of implications of untreated TB (36.00%), and major non-awareness (64.00%). Most of the respondents had high income, while some had low income. Majority are employed, while minorities are unemployed (16.0%). Majority of the respondents were educated, while, minority are uneducated. There was availability of free drugs in the observed facilities (100.00%). The distance from facilities was mostly far, and few respondents are close to facilities. Most of the indices studied in this study shows positive outcomes; this might me the reasons for high compliance rate.

CONCLUSION

There is high compliance rate among the studies respondents and it might be because of the underlying positive determinants found.

Funding:
This study has not received any external funding.

Ethical approval
The ethical approval was taken for this study which include consent, confidentiality, privacy, dissemination of results and the right to withdraw from the study of the respondents. Permission from relevant authorities was sought.

Conflict of Interest:
The authors declare that there are no conflicts of interests.

Data and materials availability:
All data associated with this study are present in the paper.

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